

# Leading Edge

April 2005

Air Force Materiel Command



Link-16 soars, page 11

## Now and then, here and there

*Master Sgt. Joel Donihoo, an individual mobilization augmentee with the 19th Air Refueling Group, traveled more than 10,000 miles to a forward operating location on his first deployment since Vietnam. Master Sgt. Donihoo holds a picture of himself taken during his first deployment to Guam in 1973 in support of the Vietnam War. (AF photo by Sue Sapp)*





## LEADING EDGE

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## Around the command



Gen. Gregory S. Martin



# Airmen Helping Airmen

**I**n the Air Force, our mission is best accomplished when we make taking care of our people and their needs Job No.1. One way we can all help with this goal is to contribute to the Air Force Assistance Fund.

Last month, AFAF began its annual campaign, "Commitment to Caring," which raises funds for the AFAF through April 15 at all Air Force Material Command organizations. This campaign, which is run within the Air Force, truly embodies the spirit of its philosophy, "Airmen helping Airmen."

*Staff Sgt. Christopher Nelson holds his 3-month-old daughter Alyssa. She was born while he was deployed to Manas Air Base, Kyrgyzstan, with members of the 78th Civil Engineer Group, Robins AFB, Ga. (AF photo by Sue Sapp)*

**Contact your Family Support Center or visit AFAF Web**



The annual AFAF campaign raises funds for four charities that provide support to the Air Force family, including active duty, retirees, reservists, guard and their dependents, including surviving spouses.

The Air Force Village Foundation, Inc., the Air Force Enlisted Village, Inc., the General and Mrs. Curtis E. LeMay Foundation, and the Air Force Aid Society, Inc., help Air Force people with financial assistance for emergencies, educational needs, or securing retirement home for widows or widowers of Air Force members with financial needs.

During this fund drive, I ask that you consider supporting these worthwhile organizations.

#### **Air Force Village Foundation**

The Air Force Village Foundation provides retirement living and health care for retired military officers and their spouses, with priority to retired widows and widowers in need of financial assistance.

#### **Air Force Enlisted Village**

The Air Force Enlisted Village offers housing and financial assistance to surviving spouses of retired Air Force enlisted members.

#### **LeMay Foundation**

The General and Mrs. Curtis E. LeMay Foundation helps widows of all Air Force retirees, both officers and enlisted, through financial assistance grants.

#### **Air Force Assistance Fund**

The Air Force Assistance Fund provides financial relief to Air Force members and their families and to help finance their higher education goals. Most importantly, AFAS provides critical help to Airmen in need by providing interest-free loans and grants for short term or one-time emergencies such as food, rent, and utilities.

More than 90 percent of the organization's emergency assistance goes to active-duty members and their families in the grades E-6 and below.

These four organizations help support the great Airmen who have selflessly dedicated themselves to the mission of the Air Force. For more information on these organizations, contact your unit AFAF representative, your local Family Support Center or visit the AFAF Web site at <http://afassistancefund.org/>.

I urge you to join me in making a donation to these important and worthy causes.



*Staff Sgt. Steven Rice's wife Dina welcomes him home Jan. 21. Sergeant Rice was one of the 38 members of the 78th Civil Engineer Group who spent four and one-half months deployed to Manas Air Base, Kyrgyzstan in support of Operation Enduring Freedom. (AF photo by Sue Sapp)*

**site at <http://afassistancefund.org/>**



## Latest Global Hawk software offers flight test challenge

EDWARDS AIR FORCE BASE, Calif. — Automatic contingency generation, or ACG, software, is giving Global Hawk pilots and engineers the ability to allow the aircraft to autonomously react to system degradation if the need arises.

The software is also intended to reduce pre-flight mission planning by incorporating contingency management logic in the aircraft, instead of requiring mission planners to manually plan all contingencies using the Air Force Mission Support System.

Training pilots on ACG software is a continuing challenge for testers because of the amount of developmental test and evaluation needed to figure out how the software affects the aircraft's existing capabilities along with developing the best methods to employ the new capabilities.

"We tasked the pilots by having them go to the books, or instruction manuals, and flying missions

in the simulator," said Lt. Col. James Wertz, 452nd Flight Test Squadron commander. "During the simulator missions, they logged how the aircraft behaved using the new software and helped us devise a way to get started flight testing the ACG software."

Currently, mission planning can take several weeks. The new software would reduce planning to around 12 hours. Initial flight tests in Edwards' airspace have begun testing small portions of this capability, and testers are still discovering how the software makes the Global Hawk think while in flight.

Flight missions during Operations Enduring and Iraqi Freedom have demonstrated a need for an accelerated mission planning capability, and the ACG software is designed to provide combat commanders that flexibility.

— 95th ABW Public Affairs



An F/A-22 Raptor cruises over Florida. (AF photo by Tech. Sgt. Mike Ammons)

## Eglin 'Greenway' grows, 17,670 acres added

EGLIN AIR FORCE BASE, Fla. — More than 17,000 acres will be added to the 100-mile conservation corridor between Eglin AFB and the Apalachicola National Forest as part of the Northwest Florida Greenway Initiative, a partnership between the Department of Defense, the Florida Department of Environmental Protection and The Nature Conservancy.

This acquisition is part of a Congressional authority allowing U.S. Armed Forces to partner with states and nonprofit organizations to reduce

encroachment on military operations by preserving natural habitat.

This corridor will allow for continued training and low-level missions at Eglin and four other Air Force and Navy installations in the region.

"This project will play a critical role in sustaining Eglin's military mission by protecting our range and special use military airspace from urban encroachment," said Col. Robert Nolan, 46th Test Wing commander.

"Preserving this landscape protects

## Predator reaches initial operating capacity

LANGLEY AIR FORCE BASE, Va. — One of the most heavily used and valued weapon systems of Operations Enduring Freedom and Iraqi Freedom has reached initial operating capability, Air Combat Command officials announced in March.

The MQ-1 Predator unmanned aerial vehicle was officially declared IOC March 1 by Lt. Gen. William Fraser III, ACC's vice commander. The milestone was reached after the MQ-1 completed eleven requirements including supportability, maintainability and aircraft and parts availability.

Initially fielded as the RQ-1, an

advanced concept technology demonstrator, the Predator was first used in the Balkan theater in the mid-1990s. Over time, the aircraft has undergone various upgrades to improve its combat effectiveness. The MQ-1 version is equipped with advanced sensors and armed with AGM-114 Hellfire missiles.

The IOC declaration indicates the MQ-1 has completed its testing and achieved predetermined capability and supportability thresholds, and continues on its path to achieving full operational capability, officials said.

— 95th ABW Public Affairs







*Capt. Michael Vanone, 452nd Flight Test Squadron Global Hawk test pilot, tracks his virtual aircraft in the Global Hawk simulator at Edwards AFB, Calif. (AF photo by Capt. Kelly George)*

## Portable tool improves C-17 flexibility

ROBINS AIR FORCE BASE, Ga.—A portable tool is helping sheet metal mechanics in the Maintenance Directorate's C-17 maintenance branch keep the aircraft flexible.

A two-part portable milling machine provides aircraft mechanics an easy way to trim the area between the aircraft's wing and fuselage, allowing the area to move more smoothly while carrying cargo.

The tool has pre-set angles and depths, and is clamped to the aircraft to trim away excess materials, giving the area a greater range of motion.

The portable milling machine brings the skills of a conventional

machine shop to the aircraft, according to Ken Pollock, Boeing maintenance and modifications engineer.

"The purpose of the modification on the frame of the aircraft is to enhance the durability and function of the structure in the immediate area in order to lengthen the lifecycle of the aircraft," he said.

The tool simplifies a tedious task, said Denise Bryant, C-17 Production Branch chief.

"It makes it easier by having the tool attached to the aircraft, rather than having to take the part off and taking it somewhere to work on it," she said. "Now, we're able to do the work right there."

— 78th ABW Public Affairs

## to conservation corridor



habitat for wildlife and contributes to the nation's military mission," said Department of Environmental Protection Secretary Colleen Castille. "This unique collaborative effort is a testament to the ability of governments and non-profit organizations to join forces and provide long-term protection for Florida's environment."

— 96th ABW Public Affairs

*The Scrub-jay is a common site in the Florida habitat. (Courtesy photo)*



*The RQ/MQ-1 Predator (left) unmanned aerial vehicle is a light-weight, low horse-power aircraft capable of flying more than 20 hours of intelligence, reconnaissance and surveillance missions, helping protect ground troops in Iraq. (Army photo by Spc. Leah R. Burton)*

*John Reynolds, sheet metal mechanic, attaches a router motor to the C-17 grip milling machine before it is placed in the aircraft. (AF photo by Sue Sapp)*







# Air Force Research Lab's



**Total**

*The Total In-Flight Simulator, or TIFS, uses two interchangeable noses to perform a variety of tests: a simulation cockpit nose, shown above, and an avionics nose called the Avionics System Test and Training Aircraft, or ASTTA. (Courtesy photo)*



**By Melissa Withrow**  
AFRL Public Affairs  
Wright-Patterson AFB, Ohio

**T**he Air Force Research Laboratory's Total In-Flight Simulator, a one of a kind tool, is celebrating 50 years of service this year.

Called TIFS, the simulator began serving the Air Force March 22, 1955, like most C-131 Samaritan aircraft. After performing various transport operations for about a decade, the Air Force Flight Dynamics Laboratory, now AFRL, chose it for a very special mission: developing the next generation of air vehicles.

During an extensive renovation, AFRL transformed the airplane into TIFS, which can be programmed to simulate virtually any type of air vehicle in flight. When most other C-131s left the Air Force's active fleet in the late 1970s, TIFS was just beginning to support programs like the space shuttle, the B-1 and B-2 bombers, and numerous private sector test and development efforts.

AFRL's Air Vehicles Directorate owns TIFS, and Calspan Corporation operates it

through a Cooperative Research and Development Agreement (CRADA). Norman Weingarten, Calspan's in-flight simulation operations manager, started working with this airplane as a project engineer when it was first transformed into TIFS. During his career, he has gained respect for TIFS and in-flight simulation, the most realistic way to test air vehicles and their systems.

"It's more realistic than a ground simulator because you are flying an actual airplane in real world motion with real world visuals," said Weingarten.

When they fly the real airplane after TIFS flights, pilots frequently remark that it handled exactly the way that TIFS simulated it. What's more, TIFS allows pilots





# one-of-a-kind simulator

## Celebrating 50 years of service

to operate during simulated failures, giving them the opportunity to study dangerous situations in a safe vehicle that can instantly revert back to normal control.

"Often, you don't want to fail a system on an airplane, even in a test mode, because it might be too dangerous to fly. Our airplane can do that safely," said Weingarten.

# In-

TIFS is also helpful to engineers. "I've gotten to fly over 500 hours in the airplane as an engineer. On the ground, all

you do is look at computer outputs, time histories, squiggles, graphs, and displays. But, when you are actually up there and experience all of the little oscillations and responses, it brings a sense of reality to the test. Flying helps you to appreciate the problems that you are investigating," said Weingarten.

TIFS is highly versatile. It uses two interchangeable noses to perform a variety of tests. Depending upon the type of research, TIFS can switch between a simulation cockpit nose and an avionics nose called the Avionics System Test and Training Aircraft, or ASTTA.

In the simulation cockpit configuration, a test pilot flies TIFS, which duplicates the characteristics of a simulation model programmed into its computer.

During flight tests, this computer adjusts TIFS's handling characteristics by hydraulically actuating the plane's "extra" control surfaces, which include side-force surfaces and direct-lift flaps.

The ASTTA configuration lets TIFS perform avionics testing using an onboard radar, infrared electro-optical detection systems, inertial navigation, and Global Positioning System.

For both configurations, TIFS retains its safety cockpit located above and behind the nose. Here, a pilot stands by to take control and override the simulation when required.

TIFS is based in Niagara Falls, N.Y.;

# Flight

however, it frequently makes trips to different test locations.

It is available to anyone in government and industry requiring its test capabilities.

"It's not as expensive as flying a jet airplane and its availability for testing is often better than other aircraft such as the C-17, C-5 or KC-135. Competing for a test range can be a costly and time-consuming ordeal, but Calspan is already approved by the FAA to fly in many test areas. TIFS can do a lot of things cheaper and just as effectively, and it is open to everybody," said Vincent Raska, AFRL's TIFS project monitor.

Over the years, TIFS has supported a variety of programs. It helped engineers aid NASA's research in developing a cost-effective next-generation supersonic transport by evaluat-

ing the feasibility of landing without forward visibility, relying on sensors and displays alone.

In addition, TIFS recently supported ITT Industries' Airborne Natural Gas LiDAR (Light Detection and Ranging) Emission technology. ANGLE uses LiDAR lasers to detect natural gas pipeline leaks and identify their source to within 10 feet from 1,000 feet in the air.

TIFS's flexibility allows scientists to support a wide variety of programs. In addition to swapping noses, engineers can easily modify TIFS to carry test components, such as sensors, computers, or displays, depending on the project.

Each project is different, and the changing needs of this research have required continuous updates.

For example, about 10 years ago, an update replaced TIFS's 25-year-old turbo prop engines and propellers with more efficient ones.

More recently, TIFS's simulation cock-

# Simulator

pit gained a new nose cap and canopy, which added room to accommodate additional test equipment including a new instrument panel, side and center consoles, rudder pedal and throttle feel systems, additional sensors and displays. These continual updates ensure TIFS will keep providing its unique and vital capabilities well into the future.

With 50 years of service, TIFS continues to make important contributions to the future of air vehicles. Major Raska hopes TIFS will be around for many years to come.

"I'm all about recycling and reusing," he said. "Despite being older, it has a lot of capability. It is very versatile and flexible and is one-of-a-kind."

*The TIFS flies with the simulation cockpit nose configuration. (Courtesy photo)*





# Hands on

## Process improvements enhance depot performance



**By Larry Birri**  
AFMC Logistics Directorate  
Wright Patterson AFB, Ohio

Getting aircraft back into the hands of the warfighter—that's the main goal of Air Force Materiel Command's three air logistics centers. Through process improvement initiatives implemented over the past five years, the ALCs are getting better than ever at accomplishing that goal.

Oklahoma City ALC, Tinker Air Force Base, Okla.; Ogden ALC, Hill Air Force Base, Utah; and Warner-Robins ALC, Robins Air Force Base, Ga., decreased the number of aircraft in depot by 22 percent in fiscal year 2004, increasing on-time delivery to 92 percent for the fiscal year, the highest ever recorded performance.

From 2000 to 2001, the ALCs averaged 67 percent.

Efforts by the ALCs to improve depot maintenance aircraft production have reduced depot flow days, or the amount of time an aircraft spends in depot, and improved process predictability.

By shortening the time an aircraft stays in depot, AFMC retains fewer aircraft in depot while continuing the same level of production. This reduction in depot-possessed aircraft has increased the number of aircraft the warfighters have available to perform various Air Force missions.

### C-5 production at Warner-Robins ALC

WR ALC established cell support teams to reduce the amount of time mechanics were spending on tasks that weren't actual repair work. Critical parts were moved to point of use, eliminating wasted time moving parts to the aircraft. Production control boards have been developed and are updated daily to reflect the status of each aircraft. These boards ensure that the workforce keeps its focus on meeting the production schedules. As

a result of these improvements, C-5 on-time delivery increased from 10 percent in 2000 to 100 percent in 2004

and 2005. Programmed depot maintenance flow days were also cut by 131 days during this period. This reduction in flow days returned 12 C-5s to the warfighter since 2000, a 50 percent reduction in depot-possessed C-5s.

enhance the culture of continuous improvement. KC-135 on-time delivery improved from 20 percent in 2000 and 2001, to 85 percent in 2004 and 93 percent through January. Like Warner-Robins did with the C-5, Oklahoma City ALC cut flow days on the KC-135 by 222 days, from 427 in 2000 to 205 in 2004. This dramatic reduction in flow days returned 103 KC-135s to the warfighter since 2000, a 60 percent reduction in depot-possessed KC-135s.

### F-16 Production at Ogden ALC

The F-16 production branch at Ogden's ALC was challenged to reduce depot-possessed F-16s by 10 percent. To meet this goal, Ogden ALC created a senior-level process improvement team to analyze every aspect of the common configuration implementation program modification process, one of the major F-16 modifications performed at Ogden. The entire common configuration implementation program line was transformed into a one-piece flow, 11-cell operation by incorporating Lean techniques. Other initiatives included point-of-use parts cabinets, on-site computers, scaled technical orders, special tools, and standardized tool boxes in each cell. These changes led to improving F-16 on-time delivery from 64 percent in 2000 and 2001 to 96 percent in 2004 and 100 percent through January. The new process's reductions in flow days has led to 14 F-16s being returned to warfighters

since 2000, a 12 percent reduction in depot-possessed aircraft.

These process improvement efforts are due to the support of depot back shops, improved supply support and senior management support. Most process improvement efforts claim success with reduced flow times or decreased costs. The process improvements seen in the aircraft production shops at the three ALCs have put more than 100 aircraft back in the hands of the most powerful air force in the world.



*A KC-135 aircraft mechanic performs heavy programmed depot maintenance on a KC-135 structural component. (AF courtesy photo)*

### KC-135 production at Oklahoma City ALC

Oklahoma City's ALC completed a value-stream map, visually depicting aircraft, information and material flow from induction to delivery. The value stream map highlighted high-value targets for improvement. Rapid improvement events were used to attack these targets, eliminating waste from the programmed depot maintenance process. More than 600 personnel were trained in Lean theory to





# B-2, AWACS link up

## Aircraft team up for Link-16 tests at Edwards

*An E-3 Airborne Warning and Control System aircraft from Tinker AFB, Okla., flies a mission. The E-3 Sentry is a modified Boeing 707/320 commercial airframe with a rotating radar dome. The dome is 30 feet in diameter, six feet thick and is held 11 feet above the fuselage by two struts. It contains a radar subsystem that permits surveillance from the Earth's surface up into the stratosphere, over land or water. The radar has a range of more than 200 miles for low-flying targets, and farther for aerospace vehicles flying at medium to high altitudes. (AF photo by Tech. Sgt. John K. McDowell)*



**By 1st Lt. Brooke Davis**  
95th ABW Public Affairs  
Edwards AFB, Calif.

A transient E-3 Airborne Warning and Control System based at Tinker Air Force Base, Okla., teamed up with the Global Power Bomber Combined Test Force for one week to conduct Link-16 integration demonstration tests on the B-2A Stealth Bomber.

Link-16 is a digital data transmission system that broadcasts information at a high data rate.

It's a secure, jam-resistant data system that enables aircraft, or participants, to share and receive data with other aircraft flying within line-of-sight, said Wayne Clair, Global Power Bomber CTF project engineer.

"The strength of Link-16 over some older airborne data network designs is that there are no critical players," he explained. "If one participant fails or is destroyed, the network is not brought down. This feature, combined with the high data rate and a flexible message set that supports a wide range of mission functions, is why more and more military agencies are adopting Link-16 as the primary data link."

To accomplish Link-16 integration testing, the Global Power

Bomber CTF flew the bomber for 11 sorties that wrapped up in December.

The B-2A is the threshold bomber for Link-16 integration, and the addition of Link-16 represents a dramatic leap forward in the way battlefield information is transferred and shared with friendly forces, said Mr. Clair.

**"...there are no critical players. If one participant fails or is destroyed, the network is not brought down."**

Maj. Jeff Warmka, 419th Flight Test Squadron project pilot, said, "Since Operation Allied Force, our Air Force leadership has clearly articulated a vision of getting real-time information into the cockpit. Although the B-2A was designed for strategic strikes well forward of the battle lines, Link-16 now gives commanders in large-scale regional conflicts the ability to reach out and task B-2As within the battle-area.

"This will really make a difference in time-critical targeting operations," he said.

Although it will take the engineers several weeks to sort through the test data, preliminary indications from the test flights are that the B-2A fleet will soon receive the Link-16 capability, delivering on the vision of Air Force leadership, said Mr. Clair.



# Lean Force



*(Left) Bobby McCook (left), team lead for implementing a new bench stock bin system, shows John Tucker, F-15 hydraulics mechanic, the new bins that hold parts. The bins will be located between aircraft worked by mechanics on the upper and lower work areas in the F-15 PDM Cell 2 work area. (AF photo by Sue Sapp)*



By Holly L. Birchfield  
78th ABW Public Affairs  
Robins AFB, Ga.

*(Right) John Burch, sheet metal mechanic, easily accesses a tool from a tool tray. (AF photo by Sue Sapp)*

**“You’re not walking all over the place looking for stuff now. Everything is right there where you work, so it saves you a lot of time.”**

A new bench stock bin system is giving aircraft workers on the F-15 Program Depot Maintenance line a way to visually manage their workload.

A Lean event team, composed of aircraft mechanics, Lean facilitators and a representative from Science Applications International Corporation, met and established a system of clear bins, labeled by part number and type. Science Applications International Corporation supplies bench stock parts for all aircraft at Robins.

Mark Bennett, Lean facilitator for the F-15 Lean Office, said the bin system gives mechanics a better way to track parts inventory.

“This gives these workers a visually managed system for their parts,” he said. “Now they can just walk up to these bins





## What is Lean?

The Lean process is a systematic way of eliminating waste in any work process. It is a fluid process of analyzing a task and discovering what time and work adds value to the finished product and eliminating what time and work does not add value.

Air Force Materiel Command is incorporating Lean processes into all areas of depot level maintenance, savings costs and returning aircraft faster to the warfighter.

The theory or process of Lean manufacturing was first used by Toyota to help it compete with larger, more established companies before and after World War II. Since then it has been used by several American companies such as Dell, Wal-Mart and UPS, making them industry leaders.

When fully embraced by an organization, the lean process is used in all areas to help create an environment of continuous improvement. This continuous improvement can be seen within AFMC, from more efficiently using ramp space, to increasing the number of aircraft available to the warfighter, to helping individuals do their jobs faster and better.

The Lean process can be considered a revolution of increments. It is not about making dramatic changes, but about finding ways every day to do the job better. The process is about management working with employees to improve the organization as a whole, not just an individual aircraft depot maintenance program. Lean is unending, as the goal is not a specific improvement, but the process of improving.

and they can see what they're looking for."

Bin racks will be located between aircraft worked by mechanics on the upper and lower work areas in the F-15 PDM Cell 2 work area where workers correct problems identified during the inspection phase of the PDM process.

Will Crosby, an aircraft mechanic in Cell 2, worked with other mechanics on the Lean team to decide necessary items for the bins. He said having the right parts within easy reach helps him get his job done a lot quicker.

"Once we determined what we needed and how much we needed, it made it a lot easier to get the hardware out of there," he said. "We've worked it out where the bins hold the proper quantities of items we need to get the job done."

John Tucker, a hydraulics mechanic,

said the new system has greatly improved operations in the cell.

"The items on the bench stock are now grouped according to series and part number," he said. "So, now all the bolts are in one section and all the screws are in another section, which makes it easier for mechanics to go to the (bins) and find exactly what they need."

John Burch, a sheet metal mechanic, agreed.

"It has been 100 percent better," he said. "You're not walking all over the place looking for stuff now. Everything is right there where you work, so it saves you a lot of time."

Mr. Bennett said the Lean event exceeded its goal of improving the aircraft repair process by 47 percent, saving thousands of dollars in manpower costs.



# Strong Finish



**By Lanorris Askew**  
78th ABW Public Affairs  
Robins AFB, Ga.



**W**hether it's an F-15 canopy, weathered and worn from the fray, or a piece of refurbished metal from the sheet metal shop, the employees in the Robins Air Force Base, Ga., electroplating shop work tirelessly to make them new again.

The 26-person team serves as the support agency for various organizations on base using the electro-chemical process of electroplating to put a new finish on aircraft components.

Thirty different processes are carried out in the shop, but every part is different and may call for a different procedure, according to Murry Jackson, electroplating shop supervisor.

"When newly manufactured aircraft parts or components are taken off of an

aircraft and sent to us, we use six different blasting processes to remove any paint, sealant or surface corrosion," he said. "And then we use a chemical stripping process to remove the plating."

The parts are then taken through a non-destructive inspection, or NDI.

Four process inspections determine whether there are cracks or other problems with the part. If shop workers determine there is a crack or other deficiency, the process ends there.

"We don't have the authority to make any repairs or decisions about what will happen to the part," said Daral Harrison, who has been a non-destructive inspector for six years. "If the part is cracked we send it back to its owners and they decide what will be done with it."

If the item passes the rigorous inspection, which involves the use of a black light or an eddy current machine to detect irregularities, the part can continue on to electroplating.

The plating shop uses 20 electroplating processes to deposit a thin layer of metal onto the aircraft components.

"We are kind of like the corrosion control facility," said Mr. Jackson. "That's the purpose of the plating. When you have bare metal or bare aluminum we put a type of coating onto the part so it won't corrode or rust."

Ray Henley has been in the plating

## Electroplating shop makes parts like new





*Willie Jolly, mediablaster, blasts fire extinguisher tanks with plastic media before they will be plated. (AF photo by Sue Sapp)*

business for 27 years, 16 of which have been at Robins.

An electroplater in the shop, he said he enjoys his work and looks forward to each new day.

"It's a challenging job, but it means making the aircraft safer for everyone and it feels good to give a quality product," he said.

Mr. Jackson agreed.

"It makes me feel good to put out good quality work in the least amount of time to help support the mission," he said. "This shop supports just about everybody. All manufacturing components and all aircraft parts for overhaul have to come through our shop to be treated and plated for corrosion.



*Danny Bell, electroplater, cleans aluminum parts in the shop. (AF photo by Sue Sapp)*

"Eighty-five percent of our work load is from the C-130 propellers, but we support just about every maintenance organization," Mr. Jackson added.

"There is always something different to do," said Mr. Harrison. "It's never monotonous."

Eddie Chavez has been a blaster for

three years and agrees that the work is always changing but he loves the people and the environment.

"We are doing a good thing for the war fighter by helping him in our own little way in the war against terrorism," he said. "Our day usually depends on the workload but it's not hard to stay busy all day."





## Interview: Brig. Gen. Erwin “Erv” Lessel III

### General deploys as coalition spokesman

*The Leading Edge spoke with Brig. Gen. Erv Lessel, AFMC Deputy Director of Plans and Programs, Feb. 12, while he was deployed to Iraq. General Lessel was the deputy chief of staff for strategic communications, Multinational Force-Iraq from July 2004 to February.*

**Q What’s on your mind as you are preparing to leave the country?**

**A** I’m saying goodbye to dear friends and professional acquaintances in the Iraqi government and to the senior leaders of the Multinational Force here. The Iraqis are very brave and courageous and have great vision for their country. I think of the history we’ve made here leading up to the elections on Jan. 30.

**Q How have the recent elections changed the atmosphere there?**

**A** The Iraqis gained a great deal of confidence with free elections. They went out and stood up against the insurgents and terrorists by voting. They’re proud of what they accomplished, participating in the first free and fair election of their lives. They are living in a democracy for the first time. One friend of mine, a senior national security advisor in the Iraqi government—a man in his 50s—told me he went to the polling place, walking hand-in-hand with his mother. He said it reminded him of his first day of school. He and his mother were proud of going to vote for the first time in an election with a ballot having more than one name. This achievement is a testament to the great work by Coalition forces, the U.S. Embassy, and especially the new Iraqi government.

**Q How have things changed since you first arrived in Iraq?**

**A** The capability of the Iraqi security forces has improved tremendously. When I first arrived, they did

not have any battalions capable of deploying and providing security. Today, they have 40 battalions capable of doing that, and more than 90 battalions that are trained and equipped. The government has grown tremendously from a brand new entity trying to establish new processes, such as national security and strategic communications. For example, when I first arrived here they did not even have the capability to conduct a press conference. Today, they are very capable, highly confident and effective at getting the country’s message out to the people. The advances I’ve seen in the past eight months are amazing

**Q How did coming from AFMC affect your perspective?**

**A** I was impressed with the great support I received at the headquarters before I deployed and while I’ve been here. The great logistical and moral support I received, like the support so many Americans are giving to our deploying forces, makes a tremendous difference. There are many other AFMC warriors deployed to Iraq from headquarters and AFMC bases and it’s always great to see them.

**Q How has your role as spokesperson changed your perspective on international and media relations?**

**A** I’ve learned a lot about how the media operate and the importance of public affairs. We need to increase the public’s awareness and continue getting out the story about what’s happening here. I’ve done more than 100 interviews with print and television media—American, Iraqi, and international to get the word out, both good and bad. Up until about a year and a half ago, Iraq never had a free and open media. Their reporters are still growing and maturing, but they are eager to report the story and be part of the country’s free press.



*Brig. Gen. Erv Lessel was deployed to Iraq for eight months as the deputy chief of staff for strategic communications. (Courtesy photo)*

**Q What would you like Air Force people back home to know about our involvement in Iraq?**

**A** They should know that the insurgency is not over and there’s still a tough fight ahead. We’ll be going through a transition in the coming year to train the Iraqis in counter-insurgency operations so the Iraqi security forces can handle their own security needs. When they have this capability, our mission is finished. Also, we want to ensure a long-term strategic relationship with Iraq and the region. The terrorists and insurgents are not representative of the people here. The Iraqi people are thankful for liberation from the tyranny of Saddam. I’m optimistic for the future of this country.

**Q Is there anything else you’d like to add?**

**A** It’s been tough being away from family and friends, but I wouldn’t have missed this opportunity for the world. In the eight months that I’ve been here, I’ve seen dramatic changes as we’ve helped the Iraqi people rebuild their country and hold free elections. It was truly the experience of a lifetime.





# Dog handler re-enlists after devastating accident



**By Lois Walsh**  
96th ABW Public Affairs  
Eglin AFB, Fla.

**W**hile a re-enlistment itself is not an unusual event, getting there was for a dog handler from the 96th Security Forces Squadron at Eglin Air Force Base, Fla..

Tech. Sgt. Hector Barrios re-enlisted in the Air Force in January, following an 18-month struggle with amputation, reconstruction and infections with his left foot before he gained medical clearance to remain in the job he loved.

On July 15, 2003, Sergeant Barrios was deployed to Prince Sultan Air Base, Saudi Arabia, in support of Operation Iraqi Freedom. While on gate-guard duty there, he moved a wire that was strung to a concrete barrier to allow a vehicle through the makeshift gate. As the truck cleared the barrier, it caught the wire, causing the two-ton barrier to fall on Barrios' left leg and foot.

He currently has two prostheses; one for walking and one for running.

Initially, all the bones in his foot were broken. Doctors here realized that drastic measures were needed, including amputation of most of the damaged foot and hyperbaric oxygen chamber treatments.

"The doctors told me they would have to amputate my leg from the knee down," Sergeant Barrios said. "When I woke up, I only lost half of my foot, which is better for me to get around."

Sergeant Barrios said it was rough emotionally after the amputation, but his family, base hospital staff, physical therapists, unit and fellow dog handlers took care of him. It was especially difficult not knowing whether he would be able to continue his career, especially after investing 14 years in service to his country.

"You have to be positive, otherwise it doesn't do any good—I was always trying to stay positive."

One of the people Sergeant Barrios points out as a major player in his recovery is his roommate and fellow dog handler, Tech. Sgt. Jason Somers.

"He was there for me when I was injured and took me to my medical appointments and to physical therapy; he

kept me going when I had my bad days."

Sergeant Somers said Sergeant Barrios was first his boss, but then they became friends. Sergeant Somers helped Sergeant Barrios with "all the normal things we take for granted."

"It was tough for him; I got emotional with him and felt so bad about what happened to him, especially when he lost his foot," Sergeant Somers said. "It was a tough deal for everyone, but the ultimate goal a year ago was for Hector to keep his career. To reach this day when he's re-enlisting is outstanding—he's an asset."

Sergeant Barrios said he's reached his main goal of staying in the Air Force for six more years. He said his experiences show what can be accomplished "if you put your mind to something." And now, with the help of a special prosthesis, he can run a 10-minute mile.

"That's not too bad," Sergeant Barrios said as he grinned.

*(Right) Tech. Sgt. Hector Barrios poses with his military working dog at his re-enlistment ceremony Jan 28. (AF photo by Will VanderMate)*

*(Below) Sergeant Barrios received hyperbaric-oxygen therapy in September 2003 to treat the foot injury he received while deployed. (AF photo by Lois Walsh)*



# Defusing

A dusty old storage building tucked away behind an old farm house in the sleepy southern town of Byron, Ga., isn't exactly the kind of place you'd expect to find explosives.

But, in the explosive ordnance business, technicians say they never assume, unless they are assuming "worst case scenario." They never leave anything to chance. They respond to every call armed with state-of-the-art tools of the trade and countless hours of training under their belts—ready to eliminate the hazard.

An explosive ordinance disposal, or EOD, team responded to a call from the Peach County Sheriff's Department, Jan. 12. Before they entered the old shop in Byron, Master Sgt. John Bell and Staff Sgt. Joseph Fletcher climbed into their 75-pound explosion protection suits and forced on the helmets.

As they inched their way into the shop, the air was thick with fumes from degreasers, lubricants and old weathered wood. By the fading light of late afternoon, among the forgotten engine parts, rusty tools and oil stained floors, they found two high-explosive anti-tank projectiles just inside the door. One was propped against the wall on the right. The other lay on the ground beneath it. Both were covered with a thick layer of dust and cobwebs.

The EOD team's mission: maneuver the remote X-ray machine to take real-time pictures and check the ordnance for

live components.

This time, they were fortunate. The 106 millimeter projectiles, which were remnants of the 1970s, contained no live components. They were placed in the building by a now-deceased, former employee of the San Diego Munitions Depot.

"The man used to work in the depot and somehow he managed to get a hold of the HEAT (high explosive anti-tank) rounds and kept them as souvenirs," Sergeant Bell explained. "He moved a few times and then stuck them in the building. His wife was out going through the old stuff and found them."

This type of call isn't unusual for EOD technicians from the 116th Civil Engineer Squadron who responded to about 26 calls last year, some of which were from civil authorities concerning citizens who just happened upon some vintage munitions lying around their property. This is not a job for everyone. The extra \$150 each month would be of little consolation to the majority of Airmen.

However, contrary to what some people might believe, the Air Force's nearly 1,000 EOD troops are more than just thrill-seekers who like blowing up stuff.

The Air Force only accepts volunteers



**By Tech. Sgt. Beverly Isik**  
116th ACW Public Affairs  
Robins AFB, Ga.

and conducts extensive background checks, as well as physical and psychological exams on everyone who applies. Many applicants are rejected because they're not suited for the job.

Sometimes, suspicious packages and munitions like the one found in Byron turn out to be false alarms. Other times, things are more volatile.

For example, last year, as they were wrapping up a response to a suspicious package on base, the EOD team got a call to support local authorities with a suspect package at a video rental store.

"It turned out to be an actual improvised incendiary device that was designed to burn down the building," Fletcher explained.

They remotely rendered it safe with a percussion actuated neutralizer, or water cannon.

"We try not to go hands on," Sergeant Fletcher said. "We only do that as a last resort. We have certain tools we use and procedures we follow to do everything as remotely as possible."

The EOD team responds with about \$500,000 in equipment designed to make their job as safe as possible, Sergeant Bell said.

The inventory ranges from robots that poke around packages to metal cannons that shoot steel slugs or bursts of water that shred through devices. There's even a remote x-ray system used for evaluating internal components.

"We still have to go down range sometimes to set up equipment depending on what we're trying to X-ray," he said. "If

## EOD team finds explosive d



# the situation

it's something we can't move with the robot or if it's going to be a tight fit to get the X-ray equipment behind it and get an image on film, then we have to go down range."

That's why he said they have the bomb suits, flack vests and helmets.

"The bomb suit provides minimal protection from explosives point blank," Fletcher explained.

"It's actually designed for protection on the way in and on the way out."

Dressed in the Kevlar-like bomb suits, which resemble something from a science fiction movie, and armed with state-of-the-art technology and nearly 4,000 technical orders that

describe every conceivable manufactured explosive device and defusing instructions, this group of professional destroyers are trained to handle everything from match heads to atomic bombs.

*Staff Sgt. Joseph Fletcher holds the explosive device found Jan. 12 in a barn in Byron, Ga. (AF photo by Senior Airman Tim Beckham)*

## evice in Georgia barn



*Dr. Dressler, age 2, and his father read research papers at Rain Garrett Park, near Washington, D.C. (Courtesy photo)*

# Dr. Rainer Dressler

## Profile of an Air Force Scientist



By 1st Lt. Jessica Phelps  
AFRL Public Affairs  
Hanscom AFB, Mass.



An Air Force Research Laboratory scientist who was recently named an American Physical Society Fellow claims to draw his success from an initial grade-school passion for map making.

"My earliest interest in a science-related topic expressed itself in a passion for maps and geography," said Dr. Rainer Dressler. "This was triggered by an elementary school assignment where I had to draw a map of Norway. This was quite a challenge given Norway's coast of endless fjords, and I made sure they were all correctly rendered."

At 11-years-old, this interest in coastlines traveled with Dr. Dressler as he crossed the Atlantic Ocean with his family to their new home in Switzerland.

"There, I was a typical teenager, thinking more to survive in a rigorous high school, looking forward to getting out of school and doing something very different, possibly economics or law," said Dr. Dressler.

Even with his eyes focused elsewhere, Dr. Dressler was excelling in the sciences.

"I noticed that I did well in chemistry without too much effort, and that there was some interest below the surface," he said. "I had less confidence in my physics ability until my physics teacher pulled me aside one afternoon, and told me that he thought I was gifted, and if I only learned to neatly organize the problems I was solving on paper, I would have no problems acing all his tests."

His teacher's confidence in his ability steered Dr. Dressler toward a life-long journey of integrating his favorite sciences.

"I took the advice to heart, and found out he was right. The final straw pushing me toward scientific studies was a visit with an academic counselor, who, after testing me, told me that all indicators pointed toward physical sciences," Dr.



Today Dr. Rainer Dressler works at Air Force Research Laboratory. (Courtesy photo)

Dressler said. "Upon joining the Air Force as a civilian many years later, my work at the then Air Force Geophysics Lab provided the perfect combination to suit my natural abilities and interests: geography, chemistry, and physics."

Dr. Dressler's father, who was a professor of molecular physics, proved to be inadvertently influential.

of physics. A contract with a basketball team allowed me to leave home and study at a small university two hours away from my parent's home. During my third year of chemistry studies, my father casually asked me where my interests were, and told him that I was particularly interested in quantum chemistry and spectroscopy. He then told me that was what he taught

***"My father was always there to assist me, but never pushed me toward studying science. Knowing his stature, however, did kind of weigh heavy at times."***

"My father was always there to assist me, but never pushed me toward studying science. Knowing his stature, however, did kind of weigh heavy at times," Dr. Dressler said. "I thought I could avoid the association by studying chemistry instead

at his university."

The professional paths of this father and son would soon cross as Dr. Dressler returned to America, where he became a naturalized citizen on Dec. 16, 1963, and eventually began working at the

Continued on next page





Dr. Rainer Dressler sits with his dad and twin brother, Luzi, at Garrett Park near Washington D.C. (Courtesy photo)

*“As I was puzzling over the problem, a well-known American quantum chemist was touring the lab. When I told him what I was working on, he responded instantly by saying that a man with my last name back in the late 1950’s (when I was born) was the first person to properly explain this type of spectrum. It turned out that man was my father.”*

AFRL Hanscom Research Site.

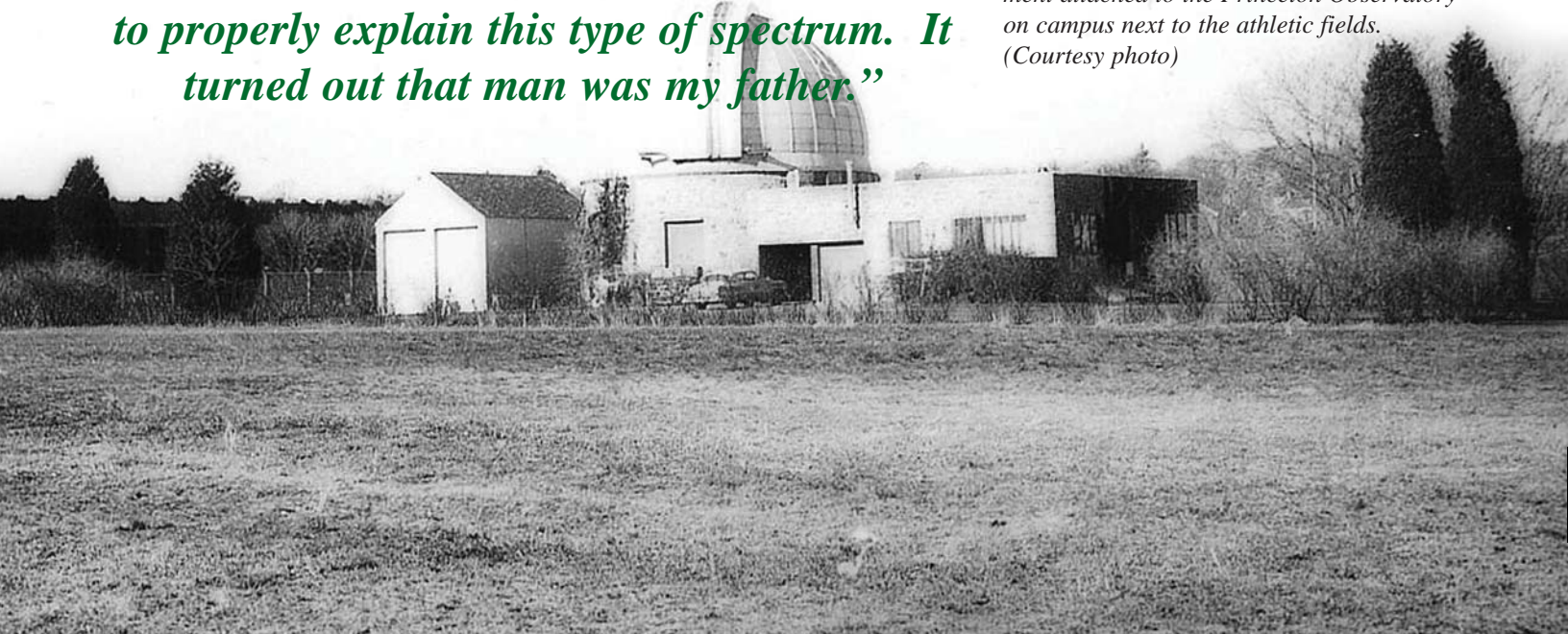
“During my first years at the lab, I was tasked with explaining radiation of a water ion that could occur in the environment of space vehicles and comets,” Dr. Dressler said. “As I was puzzling over the problem, a well-known American quantum chemist was touring the lab. When I told him what I was working on, he responded instantly by saying that a man with my last name back in the late 1950’s (when I was born) was the first person to properly explain this type of spectrum. It turned out that man was my father.”

To add to the similarities of father and son’s professional paths, Dr. Dressler’s work on the water ion led him to an invitation to the Herzberg Institute of the Canadian Research Council in Ottawa, Canada, which was also the laboratory where his father worked when he was born.

Through travel and study, Dr. Dressler’s career has brought him recognition by the American Physical Society, which only elects one half of one percent of its membership into the fellowship ranks.

“I regard having been elected a Fellow of the APS as a defining moment of my career,” Dr. Dressler said. “First and foremost, it is a reflection of the great fortune that I have had while building a scientific career. I have been extraordinarily lucky to have had exceptional mentors, and I have been blessed with wonderful coworkers, both here at AFRL as well as elsewhere in the country and overseas. I have also been fortunate to have been confronted with challenging Air Force problems within an organization that strives for excellence.”

Dr. Dressler lived in Princeton N.J. from 1960-1968. His first home was an apartment attached to the Princeton Observatory on campus next to the athletic fields. (Courtesy photo)







# Air Force musician earns doctoral degree



**By Staff Sgt. Jon Linker**  
U.S. Air Force Band of Liberty  
Hanscom AFB, Mass.

**S**taff Sgt. Amanda Dell completed a personal, 12-year journey and joined perhaps the most exclusive club in the Air Force when she was officially awarded her Doctor of Musical Arts degree March 21 from the University of Cincinnati College-Conservatory of Music.

Sergeant Dell, a clarinetist with the U.S. Air Force Band of Liberty, is one of only 14 enlisted Airmen out of 300,000 to hold such a high degree, according to Air Force Personnel Center statistics.

Sergeant Dell studied the clarinet's role in the music of the 20th century Austrian composer Anton Webern. This topic was the subject of the 202-page dissertation she completed last fall. When it was approved by the CCM faculty in November, her dissertation marked the last hurdle toward the doctorate degree she began working on in 1993.

"I remember that moment," Sergeant Dell said. "It was surreal, a little hard to believe. It had been so long, I felt like such a huge weight had been lifted. It was a good moment. I think I hugged just about everybody in the squadron."

Sergeant Dell's doctoral quest began long before she joined the Air Force in 2000. After earning a masters degree in clarinet performance from Appalachian State University in the spring of 1993, she began work on her doctorate that fall at Cincinnati. She figured she'd eventually end up teaching at a college or university.

"That was initially my goal, to teach," Sergeant Dell said. "And I also wanted to study more on the clarinet."

By 1998, she had done the required 90 hours of course work and three recitals, passed the music theory and history qualifying exams, and the written and oral comprehensive exams. The only thing left was her dissertation.

Sergeant Dell moved to Miami, where her family lived, and spent the next seven months doing research in addition to working as a nanny and performing with local woodwind groups, pit orchestras and symphonies.

At that point, a military career wasn't even on

the radar screen. A clarinetist friend of hers, however, had recently joined an Air Force band and kept telling Sergeant Dell good things about the job and encouraging her to audition. At first she was somewhat hesitant.

"I was a little scared about joining the Air Force," she said. "It just seemed so foreign to me. A musician in the military?"

We are kind of square pegs in a round hole and I was worried about that."

The more she thought about it, though, the more Sergeant Dell said she liked the idea of performing all the time in the Air Force versus teaching. She finally auditioned at Hanscom Air Force Base, Mass., in May 2000, was accepted, and joined the Band of Liberty later that year.

With her new Air Force career and a busy schedule of rehearsals and concerts, Sergeant Dell put the dissertation on hold. In the back of her mind, however, she knew she would finish it some day, even if that wouldn't result in more money or career advancement, she said.

"It was still important to me," she said, "primarily, to have it finished to have that accomplishment. I felt it would round me out as a musician no matter what I did."

With some prodding from her First Sergeant, Senior Master Sergeant Stan Holland, Sergeant Dell resumed work on the project last year.

"I made a few attempts when I first joined the Air Force but I didn't really start writing it until 2004," she said.

"[Sergeant Holland] was the one who started the ball rolling. He just kept bugging me about it."

So, Sergeant Dell took 30 days of annual leave last summer to focus on her research and writing. Then there was also the support she received from her husband and fellow band member, Staff Sgt. Dave Dell, who served as an invaluable sounding board.

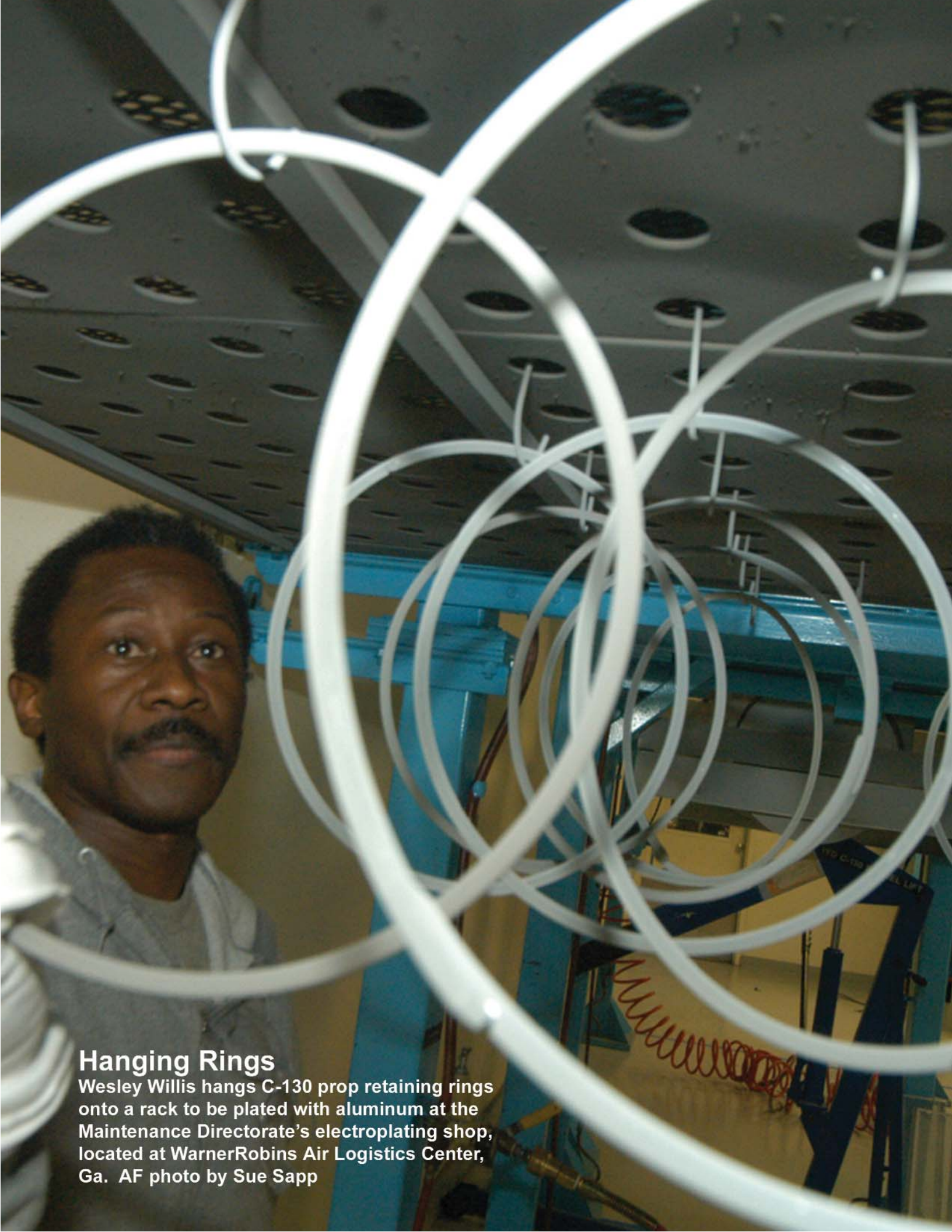
"Because he is also a musician, his insights were extremely valuable," Sergeant Dell said. "As a husband and dear friend, he did everything possible to accommodate me while I worked at home. He assumed the majority of the household chores and cooked dinner for me when he wasn't performing in the evenings."

"A fellow doctoral student at CCM told me years ago that statistics show that doctoral students who are married complete their degrees more quickly than their single counterparts," she said. "Now I understand why."



## Meet Dr. Amanda Proctor Dell





## **Hanging Rings**

Wesley Willis hangs C-130 prop retaining rings onto a rack to be plated with aluminum at the Maintenance Directorate's electroplating shop, located at WarnerRobins Air Logistics Center, Ga. AF photo by Sue Sapp